

# GALEGA ORIENTALIS LAM. VAR “GALE” NEW LEGUME, PROTEIN AND PERENNIAL FODDER CROP IN FR YUGOSLAVIA

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## ABSTRACT

In our four-year research, (*Galega orientalis* Lam.) Var. “GALE” grown in the region of North Backa, FR Yugoslavia, gave a considerably higher yield in green mass, hay, crude protein content, crude fat content, ash and dry matter contents, compared to control plant (average of the 1991/96 trials). During hay stacking, leaves did not fall off, which is a very favorable property.

## KEYWORDS

galega, green mass, hay, crude proteins, dry matter.

## INTRODUCTION

*Galega orientalis* Lam. Var. “GALE”, belongs to the legume family, var. “GALE” is sown once and used 15 years as green mass, hay, plant meal or silage. All kinds of animal are partial to it. To grow successfully, it requires fertile soils of neutral reaction. In the year of sowing, the aboveground part grows slowly and weed control must be undertaken. *Galega orientalis* Lam. Var. “GALE” is a new green nitrogen factory. *Rhizobium galega orientalis* Lam. bacteria live on its roots, in nodules which fix free nitrogen from the air, and it is, therefore, a very useful plant economically. It is propagated generally from the seed in the year of sowing and vegetatively from rhizomes that grow 7–10 cm on the root below the surface soil layer and reach the length of about 30 cm, depending on the soil looseness. New plants grow from these stalks the following year. *Galega orientalis* Lam. Var. “GALE” is a honey-carrying plant and owing to the manner of its propagation and longevity, it can be used for land protection against erosion and recultivation of damaged lands.

## METHODS

We started trials with the view to testing the agronomic properties in 1991 on chernozemic soil in the North Backa region using standard methods (randomized block) in five replicates. The trial average was our control. The main plot areas covered 10 m<sup>2</sup>. The seed was hand sown at the distance of 50 cm from the row with 10 kg/ha of seed. All other agrotechnical operations were carried out within the optimal time limits. Haymaking was done manually at the beginning of the blooming stage. The plant material was analyzed using standard methods, only for the second year of life. The plant height, the leaf–stem ratio, the yield in green mass and hay were analyzed using the variance analysis method. We monitored the trials from 1991 to 1996.

## RESULTS AND DISCUSSION

Based on the results obtained, Table 1, it can be stated that largest crude protein content in the second year of life of *Galega orientalis* Lam. Var. “GALE” was achieved in the stage of buttonization (budding) and the lowest in the stage of pod formation. With the aging, the crude protein content decreases, the dry matter content increases, but a still high crude protein content in the dry matter is observed compared to other fodder crops. Based on the results obtained, it can be stated that *Galega orientalis* Lam. Var. “GALE” is a protein crop, because it contains considerable quantities of crude proteins in all plant organs in all stages of growth, which is not the case with other fodder crops. Livestock is partial to ground dry stock and leaves as concentrated feed meal.

Based on the results presented in Table 2, it can be stated that in

agro–ecological conditions of the region North Backa, FR Yugoslavia, and in other regions with similar dry farming conditions, *Galega orientalis* Lam. Var. “GALE” attains its maximum when it is three years old.

## CONCLUSIONS

Based on the trials out in the region of North Backa on chernozemic soil, in the 1991–1996 period, in dry farming, the following conclusions can be made:

1. *Galega orientalis* Lam. Var. “GALE” is a plant that deserves to be further tested in FR Yugoslavia, both in the conditions of dry farming and irrigation.
2. *Galega orientalis* Lam. Var. “GALE” has given high yields in green mass and hay and high crude protein contents and has shown high resistance to frost, diseases and pests, *cuscuta* sp. It deserves to be spread further especially in irrigated and wet regions. It is very sensitive to drought in the emergence stage in the year of sowing. In the year of sowing, the plants grow slowly and the weeds may strangle them and threaten the plant structure.
3. Leaves do not fall off during hay stacking, which is a very important property of galega as a species.

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**Table 1**

The dry matter, crude protein and plant height in 1992, of *Galega orientalis* Lam. Var. "GALE" by the growth stages, in the region of North Backa, FR Yugoslavia.

	Stages	Buttonization	Blooming	Pod Formation
dry matter [%]	whole plant	20.75	25.1	30.75
	leaf	18.21	21.25	23.21
	stalk	26.60	28.30	39.32
in dry matter crude proteins [%]	whole plant	27.77	24.56	21.77
	leaf	31.30	31.60	26.73
	stalk	13.52	11.52	10.19
plany height [sm]		105	127	135

**Table 2**

Agronomic properties of *Galega orientalis* Lam. Var. "GALE" in agroecological conditions of the region of North Backa by trial year and swath, the beginning of blooming stage.

Years	Swaths			Total (I+II+III) green mass t/ha
	I green mass t/ha	II green mass t/ha	III green mass t/ha	
1991	21.50	11.00	-	32.50
1992	26.70	18.88	11.18	56.76
1993	35.65	22.27++	10.76	68.68++
1994	38.98++	70.55++	18.33++	77.86++
Average 1991/94	30.70	18.17	10.06	58.93
L.S.D. for P=0.05%	0.75	0.78	1.75	0.84
P=0.01%	4.51	1.38	2.78	4.88

  

Years	Swaths			Total (I+II+III) green mass t/ha
	I hay t/ha	II hay t/ha	III hay t/ha	
1991	5.50	1.90	-	7.4
1992	6.38	4.57	4.47+	13.42+
1993	7.13+	4.45+	2.15	13.73=
1994	7.79++	4.10++	3.66++	15.55++
Average 1991/94	6.70	3.75	2.07	12.52
L.S.D. for P=0.05%	0.80	0.43	0.21	0.96
P=0.01%	1.22	1.75	1.71	1.53